ASTROCOM CORPORATION
2415 ANNAPOLIS LANE
SUITE 170
PLYMOUTH, MN 55441
FAX (763) 551-0664
(763) 694-9949
(800) 669-6242

POWERLINK ProSeries

QUICK START MANUAL v2.5

ASTROCOM™
UNITING THE DIGITAL UNIVERSE℠

2415 Annapolis Lane, Suite 170
Plymouth, MN 55441
Phone: (800) 669-6242
Fax:(763) 551-0664

www.astrocorp.com

TABLE OF CONTENTS

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for class B digital device, suitable for home or office use, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in an industrial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a dealer or an experienced radio / TV technician for help.

CAUTION: The user that makes changes or modifications to this product without the approval of Astrocom Corporation that cause this product to not meet part 15 of the FCC rules could void the user's authority to operate this product.

Repair service or warranty information may be obtained by contacting Astrocom Corporation at:

2415 Annapolis Lane
Suite 170
Plymouth, MN 55441

(763) 694-9949 or (800) 669-6242

World Wide Web Internet: www.astrocorp.com

No user serviceable parts are contained in the PowerLink Pro100. Please contact Astrocom for repair or warranty information.

Operating Characteristics

Input Power:	12 VDC, 3 Amps
Operating Temperature:	0 to +40° C
Storage Temperature:	-20 to +70° C
Humidity:	5% to 95% RH, non-condensing
Shipping Weight	5.75 Lbs

Warranty and Customer Support

Standard Warranty

Astrocom warrants that the Products shall be free from defects in material and workmanship for a period of thirty-six (36) months from the date of shipment from Astrocom's premises. If a confirmed hardware failure occurs, Astrocom will replace the Products with refurbished Products in similar condition at no charge. If the request for replacement Products is received by Astrocom's Technical Support staff by 4:00 p.m. Central Time, the replacement Products will be shipped to arrive the next business day. Astrocom shall not pay anyone any amount for warranty work or other repair work performed by any third party, unless such warranty or other repair work was approved in advance in writing by Astrocom.

THE EXPRESS WARRANTIES SET FORTH IN THIS PARAGRAPH ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ALL SUCH OTHER WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY ASTROCOM. ASTROCOM SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED BY DELAY IN FURNISHING THE PRODUCTS. THIS PARAGRAPH CONTAINS THE SOLE AND EXCLUSIVE REMEDIES FOR BREACH OF ANY AND ALL WARRANTIES AND THE SOLE REMEDIES FOR ASTROCOM'S LIABILITY OF ANY KIND (INCLUDING LIABILITY FOR NEGLIGENCE) WITH RESPECT TO THE PRODUCTS COVERED BY THIS WARRANTY. IN NO EVENT SHALL ASTROCOM'S LIABILITY OF ANY KIND INCLUDE ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ASTROCOM SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSS OR DAMAGE.

Contacting Customer Support

Astrocom provides technical support 24 hours a day, seven days a week. If you have a question, call us at:

(763) 694-9949 or 1-800-669-6242

send e-mail to: help@astrocorp.com

or visit our website at: http://www.astrocorp.com

INTRODUCTION

This quick start manual is intended as a guide to setting up the PowerLink Pro100 for users who are familiar with networks and do not require detailed instructions. For more comprehensive directions, see the help screens incorporated on the web pages.

The PowerLink Pro100 has a serial port and 4 Ethernet ports. The serial port is a DB 9 connector and is configured as shown below under Control Port Connection. The Ethernet ports, Ports 1 through 4, are all 10/100mbps and can be configured in any manner desired. As shown below, the factory default setting is with Port 1 configured as the LAN port at address 10.218.217.202, but any, or even multiple, of the 4 ports can be designated as the LAN port. Also, you can multi-home a port and have both LAN and WAN addresses on a single port.

ESTABLISHING COMMUNICATIONS WITH THE POWERLINK PRO100.

WAYS TO CONNECT TO THE POWERLINK PRO100

Communication with the PowerLink Pro100 can be established through the Control port or an Ethernet port as described below.

Control Port Connection
The control port is an RS-232 male DB9 connector configured as a DCE (data communications equipment) device. Connect a terminal to the control port using a standard 9-pin serial cable wired straight through. If using a PC as the terminal, the recommended terminal emulation is a VT100 terminal emulator running at 57,600 baud, 8 data bits, 1 stop bit, no parity, and no flow control. The control port menu is plain ASCII text.

Ethernet Port Connection
The PowerLink Pro100 is shipped from the factory with Port 1 configured as the LAN port with an IP address of 10.218.217.202 and a subnet mask of 255.255.255.252. (Valid IP addresses in this network are 10.218.217.202 and 201).

Auto address assignment
If the Pro100 is in default configuration, it will monitor Port 1 for 2 minutes following power up. If there is an unanswered ARP query, the Pro100 will assume the IP address associated with the query and respond. This feature may be utilized to auto configure Port 1 as a LAN port by simply pinging the port or initiating a session (web or ftp) using the desired IP address. The netmask will be set to 24 bits (255.255.255.0).

Alternatively, you may connect to the serial port and change the LAN configuration by selecting menu item 2 and entering a different alias, IP address, network mask or Port number.

Local connection to any of the PowerLink Pro100 Ethernet ports can be accomplished using a hub or switch, or you may connect the PowerLink Pro100 directly to a PC from the PC's Ethernet port to the PowerLink Pro100 Ethernet port. For a direct connection,

you must use a **crossover cable**. The PC being used and the PowerLink Pro100 must be in the same IP network, (i.e. their IP address and subnet mask must be set to be in the same network).

If you choose to initially connect to the PowerLink Pro100 using the factory default IP settings, you must change the settings of your PC so that it is in the same IP network as the PowerLink Pro100 (required PC settings are 10.218.217.201 and 255.255.255.252).

Configuration of the PowerLink Pro100 over the Ethernet port can be accomplished using telnet or a web browser.

BASIC POWERLINK PRO100 CONFIGURATION

It is suggested that you review the network examples and their accompanying worksheets, shown in the back of this manual, prior to configuring your PowerLink Pro100. Using the example that most closely resembles your network you should then complete the worksheet provided.

Once you have completed the worksheet for your network and established communication, you are ready to configure the PowerLink Pro100.

Factory Default Settings

Default configuration settings from the factory are:

Supervisor Login name	**root** (Note, this is permanent and may not be changed)
Supervisor Password	**PWRLNK**
User Login name	**user**
User Password	**astro**
Port 1 IP Address	10.218.217.202
Subnet Mask	255.255.255.252
Serial port	57,600 baud, 8 data bits, one stop bit, no parity, no flow ctrl
Recovery	Disabled
Load Balancing	Disabled

Web(port 80) and Telnet (port 23) services enabled with access from LAN and WAN

Login

Once communications is established (see "Establishing Communications with the PowerLink Pro100" pg.7), you must login using the correct ID and password. There are 2 levels of login, "user" and "supervisor". You must be supervisor in order to make any configuration changes. The PowerLink Pro100 is shipped with a default supervisor login name of "**root**" and a password of "**PWRLNK**".

To login, enter "**root**" at the login prompt and enter "**PWRLNK**" at the password prompt. Note: name and password are case sensitive.

Required inputs

PowerLink Pro100 must be configured with a number of parameters. Minimally, these are:

- Ethernet LAN port IP address with subnet mask (this will be the gateway address for all devices on the LAN or for a firewall behind the PowerLink Pro100)
- WAN interface configuration information:
  1. WAN Port and its alias designated for each WAN router with the IP address assigned to the Port that is in the same network (address and netmask) of each router going to the WAN. Note that you can assign multiple WAN lines to an individual Port. (multi-home)
  2. Router's IP address as the gateway for that Port.
  3. Bandwidth of each line going to the WAN

- IP addresses to test each WAN line and select ICMP and or TCP should be used to test the line.
- Port forwarding information for any servers on the LAN.
- Recovery feature should be enabled.
- Session Load Balancing feature should be enabled

Setup Wizard Using the Control Port or Telnet

Once you have established communications with the PowerLink Pro100 via the Control Port or telnet, use the Setup Wizard for basic setup.
Note that when using Telnet to configure the PowerLink Pro100, the configuration file is maintained locally and must be sent to the PowerLink Pro100 using the Activate Changes function ("A") in the Main Menu. For local serial port operation, changes are activated in real time as you make them. In both cases you **must** execute the "Save Current Configuration" function in the System Utilities Menu to permanently save changes. The PowerLink Pro100 will revert back to its previous configuration file on reset or power cycling if the changes are not saved.

From the Login menu:

Basic Control Port or Telnet Setup

1 Type default user name "***root***" press enter.
2 Type default password "***PWRLNK***" press enter. You should get the PowerLink Pro100 Main Menu.
3 Type "**S**". Setup Wizard.
4 Enter "y" to continue. A brief overview will display.
5 Press any key to continue. An overview of the LAN port setup will display.
6 Enter an alias for this LAN port. (i.e. LAN1)
7 Insert IP address for the Ethernet port (PowerLink's LAN IP) – enter address in www.xxx.yyy.zzz format. (This will be the gateway address for your firewall or LAN devices)
8 Insert network subnet mask for the Ethernet card – enter mask in www.xxx.yyy.zzz format.
9 Choose whether or not to select a Port other than Port 1 for the LAN. If you do, respond accordingly.
10 Insert number of WAN lines you want to configure. Note that the wizard limits you to a maximum of 4 lines. If you require more, you must configure them using the configure WAN menu. An overview of the setup will be displayed.
11 Enter an Alias for the first WAN line. (i.e. WAN1, or USWEST etc)

12 Enter Pro100's WAN IP address for the WAN. This must be in the same network as the router.
13 Enter network mask for channel 1.
14 Select the Port or go with the default Port assigned.
15 Enter IP address of router 1.
16 Enter the uplink speed in kilo bits per second.
17 Enter the downlink speed in Kbits/sec.
18 Enter IP address for testing the line. This should be a known reliable address on the Internet.
19 Enter "y" or "n" to use pings to test the line
20 Enter "y" or "n" to use TCP to test the line.
21 Enter a port number for TCP, if selected. Port 80 will be used as default.
22 Repeat steps 18 – 21 for 2 additional test addresses.
23 Enter "y" or "n" to enable routing for this line.
24 If you wan to use Routing with this WAN line(Default mode is NAT) you must select a LAN Port to Route.
25 Repeat steps 11 through 23 for additional WAN lines.
26 Respond to enable or disable session load balancing.
27 Select the type of load balancing desired. (Intelligent or Round Robin).
28 Select whether to enable or disable line checking.
29 The message *"Current Configuration will be saved and used at boot time. Continue to save this configuration?"* will be displayed. If you select "y", the permanent configuration file will be modified to the new settings. If you select "n", the new configuration will be active but the PowerLink Pro100 will revert back to the previous settings when power is cycled or the PowerLink Pro100s reset. You may permanently save the configuration later using the "Save Current Configuration" in the Utilities Menu.
30 Done will be displayed.

PowerLink Pro100 Control Port / Telnet Description:

```
**************************************
*  PowerLink Pro100 Main Menu        *
**************************************

S     Setup Wizard
0     Select Operating Mode Menu
1     Reports Menu
2     Configure LAN Ethernet Card
3     Configure WAN Lines Menu
4     Configure QOS
5     Configure Port Forwarding
6     Configure Static Routes
N     Configure One-to-One NAT
7     Hardware Failover
8     Configure DNS
9     Configure Login Menu
U     System Utilities Menu
A*    Activate Changes
Q*    Quit Telnet
K     Set Software Key
R     Reset System

ESC  Go to the previous menu
```

* Note: These functions are only available in Telnet

S Setup Wizard — Takes you quickly to the configuration portion of (2) "Configure LAN Ethernet Card" and (3) "Configure WAN lines".

0 Select Operating Mode Menu
Set Load Balancing Algorithm
Enable or Disable Session Load Balancing
Enable or Disable Recovery
Configure Ethernet Interface
Configure Bond HTTP & GTTPS Traffic
Configure FTP Traffic Bonding
Configure Delay Line Status Reporting
Set Date and Time

1 Reports Menu
Displays current configuration
Displays network statistics
Display system Uptime

2 Configure LAN — Setup LAN Port IP address and netmask.

3 Configure WAN Lines — Setup WAN Port Configurations

4 Configure QOS — Setup Rules governing bandwidth allocation. (See Advanced Feature Configuration)

5 Configure Port Forwarding and VPN
(Use to control inbound traffic. See Advance Feature Configuration for a more detailed explanation)

VPN - If you forward ports 500 or 1723, either as an individual port or in a range of ports, you will be asked if you want to forward IPSEC or PPTP respectively.

Basic - Forwards all incoming traffic received on the PowerLink Pro100's base WAN IP addresses (those inserted as WAN lines) with a specified port to a specified LAN IP. (For example, all port 80 traffic to a web server)

Advanced Single - Forwards incoming traffic for a single specified WAN IP and range of ports to a specified LAN IP. The WAN IP can be one of the PowerLink Pro100™'s existing WAN lines or a new valid IP within one of the WAN networks. A port range can be a single port number or a range of ports.
(e.g. ###:####).
Allows for multiple servers of the same type on the LAN by forwarding single or multiple ports from a specific IP address to a single server. (For example, port 80 traffic received on IP A to web server 1 and port 80 traffic received on IP B to web server 2.)

Advanced Multiple - Forwards incoming traffic for a specified WAN IP in each of the WAN networks and range of ports to a specified LAN IP. The WAN IPs can be existing PowerLink Pro100™ WAN lines or new valid IPs within the WAN networks. A port range can be a single port number or a range of ports (e.g. ####:####).

6 Configure Static Routes Allows for the setup of static routes that will bypass the load balancing function of PowerLink Pro100 to control the route of outbound traffic.

Basic Static Routes - will send all traffic destined for a specified IP address or network of addresses over the specified WAN link. The source IP address will be the PowerLink Pro100's base WAN IP address. Fixed static routes are not redundant (they will not failover if the link goes down). Non fixed routes will failover to the next available link if the first one goes down.

Advanced Static Routes - allows you to specify the LAN IP address or network of addresses of traffic that is to be sent over the selected WAN link. You can specify any WAN IP address that is in the network of the WAN gateway (it doesn't have to be the PowerLink Pro100's base address). Additionally, you can specify a hostname for the WAN link. The PowerLink Pro100 will look in its DNS table to resolve the WAN IP address. If a link fails, the PowerLink Pro100 will take the next available WAN link for that hostname. If FAILBACK is selected, the PowerLink Pro100 will revert back to the first line if it comes back up.

Static Policy Routes - allows more flexibility to classify traffic based on protocols, source and destination ports of the traffic or Source IP address. Traffic defined by each policy entry is sent over the specified WAN link. You can specify any WAN IP address that is in the network of the WAN gateway (it doesn't have to be the PowerLink Pro100's base address). Additionally, you can specify a hostname for the WAN link. The PowerLink Pro100 will look in its DNS table to resolve the WAN IP address. If a link fails, the PowerLink Pro100 will take the next available WAN link for that hostname. If FAILBACK is selected, the PowerLink Pro100 will revert back to the first line if it comes back up.

H Configure Next Hop Routes Allows you to send traffic to the LAN port using a "Next Hop" route.

N Configure One-to-One NAT Allows for the setup of One-to-One NAT rules that will create a mapping between Internal private IP Addresses and external public IP Addresses. These rules are applicable only for **OUTBOUND** traffic

8 Configure DNS Allows PowerLink Pro100 to be the Authoritative DNS Server. For complete setup and modification of the DNS Server you must use the WEB Page setup. For a white paper on DNS, go to www.astrocorp.com/whitepaper.htm .

9 Configure Login Menu Allows for setting/changing User ID, Password and Supervisor Password.

U System Utilities Menu

- **Load Configuration File** – Replaces the current configuration with the saved file.
- **Save Current Configuration** – Saves current configuration to be used at boot time.
- **Download Configuration File** – Downloads a configuration file via ftp server.
- **Upload Configuration File** – Saves the current configuration file to the ftp server.
- **Restore system defaults** – Resets the configuration to the default factory settings.
- **Update Software** – Used to download a new software image of the PowerLink Pro100.
- **Network Services** – Allows for:
  1. Setup of email alerts/notification
  2. Web Interface access enable/disable
  3. Telnet Interface access enable/disable
  4. Display current network services state
- **Ping Utility** – Easy access to a ping test.

R Reset System Performs a software reset of the PowerLink Pro100.

Basic Setup Using the Web Page

Note that the Basic Setup and Advanced Setup pages have context relevant help screens available by simply clicking on the "Help" link associated with the feature.

Once you have established communications with the PowerLink Pro100 over the Ethernet port (see "Establishing Communications with the PowerLink Pro100" pg.7), you can configure the PowerLink Pro100 using your web browser as follows:

Basic Web Page Setup

Note that if you change the IP address of the port you are using for Web access, you will have to re-establish your connection to the PowerLink Pro100 after you activate changes.

1. On the login page, enter the Username and Password (default is "root" and "PWRLNK").
2. Update the time, date and time zone, if desired.
3. In the Basic Setup box, click on "Configure LAN".
4. Enter the Alias, IP address and Network mask and select the Ethernet Port. This will be the gateway address for your LAN devices or firewall.
5. Setup additional LAN ports if required.
6. Enable or disable "Save Changes" and click on "Activate".
7. In the Basic Setup box, click on "Configure WAN"
8. Enter the Alias, IP address and Network mask and select the Ethernet Port.
9. Enter the IP address of the router for this line. This will be the gateway for this port.
10. Enter the Uplink and Downlink speeds in Kbytes/sec.
11. Enter 3 test IP addresses and select ICMP and/or TCP testing for this line.
12. If you want to route traffic(default is NAT) through this WAN line, enable routing and select the LAN Ethernet port to route.
13. Setup additional WAN ports if required.

14. Enable or disable "Save Changes" and click on "Activate".
15. In the Basic Setup box, click on "Services".
16. Select and configure the desired services and enter the required information.
17. Enable or disable "Save Changes" and click on "Activate".

Advanced feature setup is accomplished by clicking on the desired feature in the Advanced Setup box and following the directions on the setup page. See "Advanced Feature Descriptions" and the help screens on the web page for an overview of the advanced features.

ADVANCED FEATURE DESCRIPTIONS

PORT FORWARDING

Port forwarding is used to allow inbound traffic that is generated externally (not responses to sessions initiated from the LAN side of the PowerLink) to be forwarded to an address on the LAN port of the PowerLink. If you do not forward any ports, the PowerLink will block all inbound traffic. Since the PowerLink is not a firewall, it is suggested that you forward all ports not required for services performed by the Pro100 to a LAN address. Failure to do so may result in certain services, such as passive ftp or instant messaging, to not work properly. This is due to the fact that some services may respond to queries using a random port number which would be blocked by the Pro100 if it is not forwarded.

Incoming traffic that is destined for a server (i.e. mail server, web server, ftp server etc.) will be directed to one of the PowerLink Pro100's WAN IP addresses and will contain a specific port number that designates the server type. For example, web server traffic will have port 80 in the packet. It is necessary that you configure the PowerLink Pro100 to forward any server traffic by designating the port number and the server's LAN IP address. The PowerLink Pro100 will then forward all traffic to the appropriate destination. It is necessary that you configure all servers on your network with static IP addresses since they must not change. In the following examples, where a single server is shown, it is possible to have multiple servers each performing different functions. i.e. A web server, a mail server and an FTP server.

If you have multiple servers of the same type, i.e. multiple web servers, you must use advanced port forwarding to select specific PowerLink Pro100 WAN IP to server LAN IP combinations.

Note that the PowerLink Pro100 by default uses ports 23 for telnet and 80 for web server access. If these ports are forwarded, you must change PowerLink Pro100's settings for these services or you will not be able to access the PowerLink Pro100 via telnet or web. Typically these ports are changed to 2323 and 8080. It is also important to note that if you are using the Pro100 as your DNS authority you must not forward port 53 for the addresses that are used for DNS queries (NSx) since the Pro100 must intercept these queries.

BASIC PORT FORWARDING

Basic port forwarding is configured by designating the port number to be forwarded and the LAN IP address of the server that the traffic is to be forwarded to. This results in all WAN traffic addressed to the PowerLink Pro100's base WAN IP address with the designated port number, being forwarded to that server. You must use Advanced Port Forwarding if you have multiple servers of the same type (i.e. 2 web servers) on your LAN since the traffic from all WAN lines for the particular function, i.e. web traffic on port 80, will be directed to only one server using basic port forwarding.

Note: Since Basic Port Forwarding only forwards traffic addressed to the base PowerLink Pro100 WAN address, if you have multiple WAN IP addresses for a given line, you must use Advanced Port Forwarding to designate IPs in the network other than PowerLink

Pro100's base address. Also, if you wish to forward a range of ports you should use Advanced Port Forwarding.

ADVANCED SINGLE PORT FORWARDING
Advanced single port forwarding allows you to designate WAN IP, LAN server IP address and port number ranges to forward traffic between. For example, all port 80 traffic received on a given IP address could be forwarded to web server number one and all port 80 traffic received on a different IP address could be forwarded to web server number two. Note that the WAN IP can be any valid IP in the subnet of the WAN lines.

ADVANCED MULTIPLE PORT FORWARDING
Advanced multiple port forwarding allows you to designate multiple WAN IP addresses and a range of ports to be forwarded to a LAN IP.

Routing

The routing feature in the PowerLink Pro 100 enables configuring the PowerLink Pro 100 with one of the WAN ethernet ports in the same network as the LAN port. This feature is used when there are public routable IP's in the LAN side of the PowerLink Pro 100. This allows the installation of the PowerLink Pro100 in a network with minimum reconfiguration of the existing devices. Traffic over the routed WAN link will not be NAT'd. Traffic over the other WAN links will be NAT'd in order to accomplish load balancing.

The following steps are recommended when setting up the ethernet connections for routing to the PowerLink Pro100.

1. The WAN IP, LAN IP and the firewall's IP should be in the same network as the Router.
2. PowerLink's LAN network should be a subnet of the Routed WAN network on the PowerLink.
3. Change the firewall's gateway to point to the LAN port of the PowerLink.
4. Change the gateway of the PowerLink's WAN port to point to the router.

Quality of Service (QOS)

The QOS feature in the PowerLink Pro100 enables you to allocate bandwidth to certain classifications of traffic based on a combination of parameters as defined by a Rule. The minimum rate assures that that minimum amount of bandwidth will be reserved for all traffic that fits the description of the Rule. Maximum rate limits the amount of traffic allowed for that class of traffic irrespective as to the available bandwidth.

When allocating bandwidth it is important to realize that you don't get 100% of the line bandwidth for data. A certain percentage is used up in overhead and general inefficiencies. This overhead can amount to up to 30% of line speed, thus you should assume that only 70% of the stated bandwidth is available to allocate for data. Therefore, the sum of all of the minimum rates allocated should not exceed 70% of the slowest line available. This will assure that the minimum bandwidths will be available for all Rules in the event of the failure of any line. If the sum of the minimum rates exceeds 70% of the slowest line, you will receive a warning message but the configuration will be accepted.

If the sum of the minimum rates exceeds 100% of the speed of the slowest line, the configuration will not be accepted.

QOS Rules
Each Rule defines parameters as follows:

- The Protocol of the traffic. (ICMP, TCP,UDP, GRE, ESP)
- Source Port or range of Ports
- Destination Port or range of Ports
- Packet length minimum maximum range
- LAN IP address or range of addresses

You then set the minimum and maximum rate, in kilobits per second (kbps) for that Rule.

The Pro100 generates a queue for each Rule, based on these parameters, and allocates bandwidth to that queue based on the data rate assigned.

QOS Global settings.
The global parameters required for the QOS are: queue length, Maximum Transmit Unit (MTU), miscellaneous minimum rate and miscellaneous maximum rate. Default settings for queue length and MTU are 1000 and 1500 respectively. It is suggested that these settings be left at their default values. The miscellaneous rates define how much bandwidth is allocated for all other traffic not defined by a Rule.

VPN

Note that the termination of VPN tunnels are at the WAN port of the PowerLink. You must forward port (500 for IPSEC and 1723 for PPTP), to the VPN server on the LAN port of the PowerLink, and enable the protocol forwarding. If you forward one of these ports you will be asked if you want to enable the protocol forwarding.

In order to achieve tunnel failover for VPN, you must establish the tunnel based on a "hostname" rather than a fixed IP address. Additionally, you must designate the PowerLink as the authority for the hostname. By selecting "redundancy only" for the load balanced host record, PowerLink will advertise only one address for the name resolution as long as that line is available but will advertise the next line in the record if the first line is not available.

If you establish a tunnel using a server from the LAN side of the PowerLink Pro100 you must set up the tunnel based on a "hostname" (vpn.myco.com), and a static route using that hostname for the source WAN IP address. You also must select "Failback" in the static route to ensure that outbound tunnel traffic fails back to the same IP address as the tunnel. You also must designate the PowerLink as the DNS authority for the name. This will allow the VPN server to re-establish the tunnel on line failure using the next available line as resolved by the PowerLink. You must check the "Redundancy only" box for the load balanced host record in the DNS configuration of the PowerLink so that only one IP address is advertised for that host name.

If the tunnels are to be established from remote servers or clients, you must select "Redundant only" in the load balanced host record. The Redundant only will cause the DNS to advertise only the first available address for the host name.

STATIC ROUTES

Basic Static Routes

Static routes are used to ensure that outbound traffic destined for a specified IP address is not load balanced but sent over a single route with the source address always the same. One use is to accommodate cases where the destination includes the source IP address in its validation algorithm (i.e. off site mail server). Static Routes may be fixed or non-fixed. A fixed static route will result in all traffic destined for the defined IP address being sent over the specified router and will not be redirected if that link goes down (no redundancy). A non-fixed static route will result in the PowerLink Pro100 designating which router to send all traffic destined for the designated IP address. If the selected link fails, the PowerLink Pro100 will change the route designation and after a revalidation process the session will take place over the new route (redundancy).

Note that Basic Static routes can only designate PowerLink Pro100's base WAN IP address as the source address.

Advanced Static Routes

An advanced static route gives you more control over the source LAN and WAN IP address pairs selected. With an advanced static route you can select any WAN IP in the selected network for outgoing traffic with a specified destination IP address or network of IP addresses. This varies from a basic static route where you can only select PowerLink Pro100's base IP address. You can also specify the LAN source of the traffic (an IP address or a network of IP addresses on the LAN). In addition to using the WAN IP in the network of the gateway (router) as the source address, you can use a hostname. The PowerLink Pro100™ will then look up the IP address in its DNS tables. If a specific WAN IP address is used, the traffic will not failover if that line goes down. If a hostname is used, the next WAN IP address in the PowerLink Pro100™'s DNS table for that host record will be used. When the first line comes back up, new sessions will be started on the first entry. This is useful if you want to specify a certain link to carry most of the traffic but want additional lines as backup if the main line goes down. If "Failback" is selected in the static route for the hostname entry, all sessions, including current ones, will return to the first entry. This is useful for VPN tunnels, where both ends are using a hostname to establish the tunnel and the IP address must be forced to a known state. In this case the DNS load balanced host record (i.e. vpn.myco.com) must have "Redundant only" selected so that it will only advertise the first address available in the table of addresses for that name and will also fail back when a line returns to service. This ensures that both ends of the tunnel are targeting the same IP address.

Static Policy Routes

A static policy route is similar to advanced static route but it gives more flexibility to define the traffic. In addition to source LAN IP, you can also define the traffic in terms of the protocol, source and destination ports of the traffic. Traffic defined by each policy entry is sent over the specified WAN link.

One-to-One NAT

One-to-One NAT rules creates a one-to-one mapping of the internal private IP addresses and the external public IP addresses on the PowerLink PRO 100. These rules can be defined by specifying an Internal LAN IP Range and External WAN IP range(s) for any one or each of the wan interfaces on the PRO 100.

If the WAN IP range includes the Gateway IP Address (router IP address), the PRO 100 will skip the Gateway IP and proceed to the next IP address in the range. Also, if the WAN IP Range is smaller than the LAN IP Range, the PRO 100 repeatedly loops through the WAN IP Range until it maps the entire LAN IP Range.

The selection of a WAN line for any traffic is based on the Load Balancing rules and Static Routes. The Source WAN IP address of the traffic is defined by the One-to-One NAT rules. If no rules are defined in this section, the PRO 100 uses its base WAN IP address or the Source WAN IP address defined by the Static Routes.

Note that the One-to-One NAT Rules apply only for the **OUTBOUND** Traffic.

EMAIL ALERTS

The PowerLink Pro100 can be configured to send an email notification to a designated recipient, or recipients, if a WAN links status changes. The alert will be sent when a link goes down and again when the link is restored to service. When using the serial port, in addition to configuring the PowerLink Pro100 via the System Utilities ("U") – Network Services ("N") – Set Email Alerts ("A") command, you must also do a Configure DNS command ("8") Set DNS Resolver ("C") with the IP address of the DNS server to be used to look up the address of the recipient. When using the WEB page for configuration, you can configure and enable/disable the email alerts via the Services menu.

AUTHORITATIVE DNS

The Authoritative DNS Server function is included as a feature on the PowerLink Pro100. Having the Authoritative DNS server resident on the PowerLink Pro100 enables immediate recognition of a WAN line failure and the removal of the failed line from the DNS Name Server Record that is transmitted in response to a caching server's request. This prevents the Domain Name System from advertising a malfunctioning IP address to a query and the resultant lack of access to a server. Having the DNS authority resident on the PowerLink Pro100 also allows automatic failover for VPN tunnels on a WAN failure and optionally automatic fail back when the link comes back up. To review white papers on DNS and VPN failover go to Astrocom's web site at www.astrocorp.com .
To configure DNS, go to the PowerLink Pro100 web page and select "Authoritative DNS" under the Advanced Setup category. Follow the directions on the web page.

SITE TO SITE BONDING

SITE TO SITE BONDING is available on the PowerLink Pro200 and the Pro55. This feature allows the packet load balance bonding of multiple WAN links over the Internet between two end point connections with Pro200s or Pro50s terminating both ends of the connection. The PowerLinks will distribute the traffic over all links in the configuration resulting in an aggregation of instantaneous bandwidth equal to the sum of the slowest group of links. The minimum configuration would incorporate a PowerLink Pro50 at two

sites with 2 WAN links at one site and 1 WAN link at the other site. The maximum configuration allowed is 16 sites with 4 WAN links at each site.

Traffic originating at one site with a routable destination address that is in the network of the bonded channel will be distributed over all WAN links included in the channel and will be reassembled at the destination. Once traffic is reassembled, it will be treated as if it was received outside of the channel at the destination IP address and all port forwarding rules will apply to it. For this reason, it is necessary to fully configure the PowerLink's port forwarding rules prior to configuring the bonding.

The initiation (source) and end (destination) point addresses used to establish the channels may not be used to terminate any VPN links, whether inside the channels or not. It is recommended that the base WAN IP addresses of the PowerLinks not be used as the initiation or end point addresses.

Channel setup and configuration is accomplished by first assigning a site number (1 to 16) to the PowerLink in the local Site to Site Line Bonding Configuration window. This number must be unique for each site in the group of bonded sites. You then assign a name to the remote site and add it to the group of sites. In the Configure page of the Site Management screen you then enter the remote site number (1 to 16) and the Initiation (source) and End (destination) point addresses that will define the channel end points. You also must enter the net mask that defines the addresses that will be included in the channels. The remote site would have a mirror image configuration that would point to the local site.

Once the endpoints are configured and activated, the PowerLinks at the end points will establish channels from each end point to the destination end points i.e. for a configuration with 2 WAN links at each end there will be 4 channels established. This results in a fully redundant connection where traffic will be sent over all available links to any end point address, even if that line goes down. PowerLink will monitor the channels and report any channel failures.

If you are using VPN tunnels between the sites and wish to terminate them to a private IP address on the LAN side of the PowerLink, you must configure the LAN Tunnel Identification entries with the private end point addresses and netmasks. PowerLink will then aggregate the VPN traffic in the channel and forward it to the LAN addresses. If you are terminating the VPN at a routable address in the channel network, there is no need to configure the LAN Tunnel Identification entries. In either of these configurations, PowerLink will aggregate the VPN tunnel and will direct it over all available links. If the VPN is terminated to a routable IP address and that link fails, PowerLink will continue to send traffic over the available links and continue to forward it as if the end point line was up.

HARDWARE FAILOVER

Hardware Failover with the PowerLink Pro100 is accomplished by connecting two Pro100s in parallel in the network with one unit designated as the Primary and the other as the Secondary. At any given time, one of the units will be in active mode and the other will be idle. Both units monitor the network connections based on their configuration. Failover will occur when it is determined, between the units, that the idle unit has access

to more connections than the active unit. In the instance where both units have the same level of access, the active unit will remain active.

In order to allow the Pro100 to monitor the network when it is in idle mode, it is necessary to assign idle IP addresses to its WAN and LAN ports. These idle addresses must be valid in their respective networks to enable the idle device to monitor the network. Optionally, you may choose to not have the idle device monitor the network resources. This is accomplished by not selecting the LAN or Gateway Test boxes in the Hardware Failover configuration screen.

The Keep Alive Port is used to allow the Primary and Secondary devices to communicate. The PowerLink Pro100™ that is configured to be the **Primary** uses the Primary **Idle IP** address to communicate with the Secondary. The **Secondary** will use the Secondary **Idle IP** address to communicate with the Primary. These menus are identical on both devices, so either device may be configured as the Primary or Secondary and the ***same Idle IP addresses*** "***must***" be entered in both devices. I.e. the Primary Idle IP address entry in the Primary PowerLink must be the same as the Primary Idle IP address entry in the Secondary PowerLink.

If the **Synchronize To Secondary When Saving Configuration** box is checked, the active PowerLink Pro100™ will send its current configuration to the idle PowerLink Pro100™ when changes are activated. If "Save Configuration" is selected on the active PowerLink Pro100™, the configuration will also be saved to flash on the idle PowerLink Pro100™.

The **Detection Interval** sets how often the PowerLink Pro100™ sends query packets. If the units determine that the idle device has access to more network connections than the active device, the idle device will become active and will send e-mail alerts, if enabled.

When using the Pro100 in Hardware Failover mode it is essential that the physical connections be done in a very specific manner in order to ensure that there is no single point of failure and to assure that the optimum network access is obtained. It is recommended that separate switches be used for each WAN/LAN network.

When configuring the PowerLink Pro100 for Hardware Failover there are certain settings that must be entered. Following is a list of these settings with an explanation of their purpose.

- Primary/Secondary – Designates which device will prevail in the case of both units attempting to go active.
- Synchronize to Secondary – When selected, will result in the configuration file being updated in the idle device when a change is activated in the active device.
- Detection Interval – Number of seconds between queries to the network devices.
- Failover After X Timeouts – Number of failed responses before the idle device goes active. Note that detection interval, multiplied by the number of timeouts, determines the latency time for the idle device to become active on failure of the primary.
- Idle LAN IP – IP address used by the idle device to monitor the LAN connection.
- LAN Test IP – IP address of a device on the LAN that the idle device can query (ping) to determine the integrity of the LAN connection.

- Idle WAN IP addresses – IP addresses in the network of the gateway devices (router) for each WAN line.
- Idle MAC Addresses – MAC address used by the idle device for its Ethernet connection. (Note that the ethernet port MAC address changes based on whether the device is in idle or active mode. It is suggested that the default values be used.
- Keep Alive port address – IP address used by the primary and secondary devices to communicate with the Keep Alive heartbeat and to transfer the configuration synchronization. Note that these addresses must be the same for each device, i.e. the Primary address entry should be the same entry in the Primary device and in the Secondary device.

Suggested sequence for configuring Hardware Failover
It is suggested that all networks be connected to separate switches to ensure that there is no single point of failure. **Initial configuration should be done with only the Primary device connected to the network** but with all necessary switches installed to allow inserting the secondary device when ready.

1. Configure the Primary device in the normal manner and ensure that all devices are working properly.
2. Configure Hardware Failover on the Primary device with Hardware Failover and Synchronize to Secondary selected. Be sure to designate this unit as the Primary. Be sure to save the settings so they are not lost on a power cycle.
3. Set the Secondary device to the factory default settings and then configure the Hardware Failover settings, with this device set as the Secondary and with Synchronize to Secondary selected. You must enter all Idle IP addresses. In addition you must enter the Keep Alive IP addresses if you don't use the defaults. Be sure to save the settings.
4. Insert the Secondary device into the network making all necessary connections.
5. Wait approximately one minute and observe that the Primary device is active and that the Secondary device is idle.
6. Activate changes in the Primary device with save changes selected.
7. Observe that the Secondary device now has the full network configuration and is in the idle state with the Primary active.

ADVANCED FEATURE CONFIGURATION

Control Port or Telnet Advanced Feature Setup

Port Forwarding & VPN
If you have a server on your LAN, you must set up port forwarding, as follows:
Note that if the server is behind a firewall, the IP address of the server must be the address that the firewall listens on for server traffic.

Basic Port Forwarding
1. From the Main Menu, type "**5**", Configure Port Forwarding.
2. Type "**B**", Add Basic Port Forward.
3. Enter the port number.
4. Enter the IP address of the server. (Note: The server must be assigned a static fixed IP address.)
5. If you are forwarding port 500 or 1723 respond to forwarding IPsec or PPTP.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100 is reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

Advanced Port Forwarding
Advanced Port Forwarding is used where there are duplicate server types on the LAN (i.e two web servers). There are 2 types of Advanced Port Forwarding, single and multiple. Single is used where a single WAN IP and a port or range of ports is directed to one of the servers on the LAN. Multiple is used where multiple WAN IP's and ports are directed to a server on the LAN.

Note that if the server is behind a firewall, the IP address of the server must be the address that the firewall listens on for server traffic.

1. From the Main Menu, type "**5**", Configure Port Forwarding.
2. Type "S" or "M".
3. Enter the WAN IP addresses for the networks associated with each WAN link
4. Enter the port or range of ports to be forwarded.
5. Enter the IP address of the server. (Note: The server must be assigned a static fixed IP address.)
6. If you are forwarding port 500 or 1723 respond to forwarding IPsec or PPTP.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100s reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

Static Routes

Basic Static Routes

1. From the Main Menu, type "6", Configure Static Routes.
2. Type "B" Add Basic Static Route.
3. Enter the destination IP address
4. Enter the mask for the IP address.
5. Enter Source WAN IP address (WAN address of PowerLink Pro100) or WAN Hostname (i.e. name.com) (This name must be entered in the PowerLink Pro100's DNS table in order for it to be resolved into an address.
6. Designate if you want this to be a fixed route or not.
7. Message "activating changes" will display.
8. Press any key to continue.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100s reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

Advanced Static Routes

1. From the Main Menu, type "6", Configure Static Routes.
2. Type "A", Add Advanced Static Routes
3. Enter the Destination IP address.
4. Enter the Destination Network mask
5. Enter the LAN Source IP address
6. Enter the LAN Source Network mask
7. Enter Source WAN IP address (WAN address of PowerLink Pro100) or WAN Hostname (i.e. name.com) (This name must be entered in the PowerLink Pro100's DNS table in order for it to be resolved into an address.
8. Press any key to continue.

Policy Routes

1. From the Main Menu, type "6", Configure Static Routes.
2. Type "P", Add Static Policy Routes
3. Enter the LAN Source IP address
4. Enter the LAN Source Network mask
5. Select the Protocol of the traffic.(tcp, icmp, udp, gre, esp, ah and all).
6. Enter the source port range of the traffic. (optional for tcp, udp ,all and irrelevant for other protocols).
7. Enter the destination port range of the traffic. (optional for tcp, udp ,all and irrelevant for other protocols).
8. Enter Source WAN IP address (WAN address of PowerLink Pro100) or
9. WAN Hostname (i.e. name.com) (This name must be entered in the PowerLink Pro100's DNS table in order for it to be resolved into an address.
10. Press any key to continue.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100s reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

One-to-One NAT

1. From the Main Menu, type "N", Configure One-to-One NAT.
2. Type "A" Add One-to-One NAT Rule
3. Enter the LAN IP Range Begin.(i.e, the first IP address in the LAN IP Range)
4. Enter the LAN IP Range End. (the last IP address in the LAN IP Range).
5. Enter the number of WAN IP ranges you want to configure. The value can range one from to the maximum number of wan lines on the PRO 100.
6. Enter the WAN IP Range Begin.
7. Enter the WAN IP Range End.
8. Repeat Step 6 and 7 to enter the Wan IP Ranges for the number of Ranges you want to configure.
9. Message "activating changes" will display.
10. Press any key to continue.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100s reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

Routing

When configuring the WAN port to be in Routing Mode, simply select the routing option and designate which LAN port it is to be routed to.

Quality of Service

1. From the Main Menu, type "4", Configure Quality of Service.
2. Enter "S" to enable or disable QOS
3. Enter "P" to change QOS parameters.
4. Enter "A" to add a QOS rule.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100s reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

Email Alerts

1. From the Main Menu, type "U", System Utilities Menu.
2. Type "N", Network Services.
3. Type "A", Set Email Alerts.
4. Select "y" to enable Email Alerts.
5. Enter the SMTP Server Name or IP address.
6. Enter the SMTP port number. (Default is 25)
7. Enter the recipient's Email address (multiple recipients to the same server may be entered by separating them with a space.
8. Enter your SMTP Domain name.
9. Press any key to continue.

If you designate a name for the SMTP server, you must configure the PowerLink Pro100 with an IP address for the DNS resolver using the Configure DNS command from the Main Menu before Email alert will work. This is to enable the PowerLink Pro100 to do a DNS lookup of the IP address of the SMTP server.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100s reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

Configure DNS for Email alerts

1. From the Main Menu, type "8", Configure DNS.
2. Type "C", Set DNS Resolver.
3. Enter the IP address of the DNS server that will be accessed to resolve names.
4. Press any key to continue.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100s reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

DNS Authoritative Server

Configuration of the DNS Authoritative Server must be done using the web interface. Select "Authoritative DNS" under Advanced Setup on the PowerLink Pro100 web page. You can enable or disable the authoritative server using menu item "8" (Configure DNS) and "S" (Enable / Disable Authoritative Name Server).

Hardware Failover

1. From the Main Menu, type "7", Configure Hardware Failover
2. Type "C", configure Failover.
3. Enter the desired parameters in response to the prompts.

Note: These changes will take effect immediately but will be lost if the PowerLink Pro100 is reset or if power is cycled. You must do a "Save Current Configuration" command in the System Utilities Menu to permanently save the new configuration.

Web Page Advanced Feature Setup

Quality of Service

1. In the Advanced Setup box, select Configure Quality of Service.
2. Select Enable/Disable QOS.
3. Enter the global parameters in the main box.
4. Enter all rules required in the QOS Management box.
5. Select whether to save the new configuration to the configuration file. (Note that if you do not save the new configuration, it will be activated but will revert back to the previous configuration if the PowerLink Pro100s reset or power is cycled.).
6. Click on "activate" to activate the changes.

Port Forwarding

If you have a server on your LAN, you must set up Port Forwarding, as follows:

1. In the Advanced Setup box, select Configure Port Forwarding and VPN.
2. Enter the information in the Basic, Advanced Single or Advanced Multiple table as appropriate for your network.
3. If you are forwarding ports 1723 or 500, select "Forward PPTP" or "Forward IPsec" if required.

4. Select whether to save the new configuration to the configuration file. (Note that if you do not save the new configuration, it will be activated but will revert back to the previous configuration if the PowerLink Pro100s reset or power is cycled.).
5. Click on "activate" to activate the changes.

Note that if the server is behind a firewall, the IP address of the server must be the address that the firewall listens on for that server traffic.

If you have duplicate servers (i.e. two web servers) on your LAN or if you designate a WAN address other than PowerLink Pro100's WAN IP (an address in the router's network), you must use Advanced Port Forwarding. Use Advanced Single or Advanced Multiple depending on whether you are grouping one WAN line or multiple WAN lines to a LAN IP.

Static Routes

Basic Routes

1. In the Advanced Setup box, select Configure Static Routes
2. Enter the Destination Network IP address, net mask, the router's IP address and select if it's a fixed route and if you want Failback.
3. Click on "Add" button.
4. Repeat steps 2 and 3 for all routes desired.
5. Select whether to save this configuration to the configuration file.
6. Click on "activate" to activate the changes.

Advanced Routes

1. In the Advanced Setup box, select Static Routes
2. Enter the Destination Network IP address, Destination netmask, the Source (LAN) IP address, Source netmask and the Source WAN IP address or Hostname.
3. Select if this is a fixed route and if you want failback.

   Note that if you use an IP address for the Source WAN address you will not have failover if that line goes down. If you use a Hostname for the Source WAN, PowerLink Pro100 will look up the IP address from its DNS table and will failover if the line is down. You must have entries in PowerLink Pro100's DNS table for the Hostname.
4. Click on "Add" button.
5. Repeat steps 2 and 3 for all routes desired.
6. Select whether to save this configuration to the configuration file.
7. Click on "activate" to activate the changes.

Static Policy Routes

1. In the Advanced Setup box, select Static Routes
2. Enter the Source (LAN) IP address, Source netmask.
3. Select the protocol of the traffic from the protocol dropdown. The option "all" includes all protocols.
4. Select the source and Destination Port range(optional for tcp, udp and all and irrelevant for other protocols).
5. Enter the Source WAN IP address or Hostname.

6. Select if this is a fixed route and if you want failback.

   Note that if you use an IP address for the Source WAN address you will not have failover if that line goes down. If you use a Hostname for the Source WAN, PowerLink Pro100 will look up the IP address from its DNS table and will failover if the line is down. You must have entries in PowerLink Pro100's DNS table for the Hostname.
7. Click on "Add" button.
8. Repeat steps 2 and 3 for all routes desired.
9. Select whether to save this configuration to the configuration file.
10. Click on "activate" to activate the changes.

Static Policy Routes

1. In the Advanced Setup box, select Configure One-to-One NAT
2. Enter the LAN IP Range Begin and End Address.
3. Enter the WAN IP Range(s) for any one or all of the WAN Interfaces.
4. Click on "Add" button.
5. Repeat steps 2 and 3 for all one-to-one NAT rules desired.
6. Select whether to save this configuration to the configuration file.
7. Click on "activate" to activate the changes.

Email Alerts

1. In the Basic Setup box, select "Configure Services".
2. Select "Email Alerts"
3. Enter the desired email address of the recipient. (You may enter multiple addresses separated by a space. They must be served by the same SMTP server)
4. Enter the SMTP server to be used.
5. Enter the IP address of the DNS server that will perform the lookup.
6. Enter the Domain Name for the sending email domain.
7. Enter the SMTP port number to be used or leave the default of 25.
8. Select whether to save this configuration to the configuration file.
9. Click on "activate" to activate the changes.

Configure Authoritative DNS Server

1. In the Advanced Setup box, select Authoritative DNS
2. In the Authoritative Name Server Configuration box
   - Select "Enable/Disable Authoritative Name Server"
   - Select "Check Off Site IP addresses" if desired.
   - Select "Enable/Disable this PowerLink Pro100 to act as a Backup Site" if desired. If you select this you must enter the Primary site's IP addresses to be monitored.
   - Click on "Add"
3. Select whether to save this configuration to the configuration file.
4. Click on "activate" to activate the changes.
5. In the Domains Management box, enter the new domain name and select type of site
6. Select whether to save this configuration to the configuration file.
7. Click on "activate" to activate the changes.

Configure Site to Site Bonding

Channel setup and configuration is accomplished by first assigning a site number (1 to 16) to the PowerLink in the local Site to Site Line Bonding Configuration window. This number must be unique for each site in the group of bonded sites. You then assign a name to the remote site and add it to the group of sites. The "Monitor Connections" option would only be disabled to allow trouble shooting. In normal operation the Pro200 monitors the status of the WAN connections between sites and removes inoperative routes. If monitoring is turned off, all connections will be reported as being UP irrespective of the actual Line status. This could result in loss of data and would typically only be used for troubleshooting purposes.

In the Configure page of the Site Management screen you must enter the remote site number (1 to 16) and the Initiation (source) and End (destination) point addresses that will define the channel end points. You also must enter the net mask that defines the addresses that will be included in the channels. The remote site should have a mirror image configuration that would point to the local site.

Once the endpoints are configured and activated, the PowerLinks at the end points will establish channels from each end point to the destination end points i.e. for a configuration with 2 WAN links at each end there will be 4 channels established. This results in a fully redundant connection where traffic will be sent over all available links to any end point address, even if that line goes down. PowerLink will monitor the channels and report any channel failures.

If you are bonding VPN tunnels between the sites and wish to terminate them to a private IP address on the LAN side of the PowerLink, you must configure the LAN Tunnel Identification entries with the private end point addresses and netmasks. PowerLink will then aggregate the VPN traffic in the channel and forward it to the LAN addresses. If you are terminating the VPN at a routable address in the channel network, there is no need to configure the LAN Tunnel Identification entries. In either of these configurations, PowerLink will aggregate the VPN tunnel and will direct it over all available links. If the VPN is terminated to a routable IP address and that link fails, PowerLink will continue to send traffic over the available links and continue to forward it as if the end point line was up.

Configure Hardware Failover

Configure the Primary PowerLink Pro100™ in the normal way with the Secondary disconnected from the network.

1. In the Advanced Setup box, select Configure Hardware Failover
2. Make this box the Primary, with Failover enabled and Synchronize to Secondary selected.
3. Insert the Idle LAN IP address. This must be a valid address in the LAN network.
4. Insert the LAN test IP address and select LAN Test if desired.
5. Insert Idle WAN IP addresses for all WAN networks.
6. Insert the Keep Alive addresses for the Primary and Secondary. i.e. 100.10.10.1 and 100.10.10.2. It is recommended that you use the default settings.
7. Reset the Secondary PowerLink Pro100™ to the factory default configuration, select the Hardware Failover feature, making this box the Secondary, and insert all Idle IP addresses: Idle LAN IP, LAN Test IP, Idle WAN IPs, and Keep Alive addresses.

8. Connect the Secondary to your network. The Secondary, which will be idle initially, will now accept the configuration from the Primary when you activate or change configuration in the Primary.
9. Activate or Save your configuration on the Primary. This will trigger the synchronization between the two devices.
   As long as the synchronization is ON, the ACTIVE PowerLink Pro100™ will save its current configuration to the IDLE PowerLink Pro100™ whenever changes are activated.

To make the changes permanent, be sure the "Save Changes" box is checked when you click "Activate". Otherwise the PowerLink Pro100™ will revert to the previous settings the next time it is powered on.